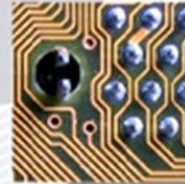


Workshop: Process Streamlining

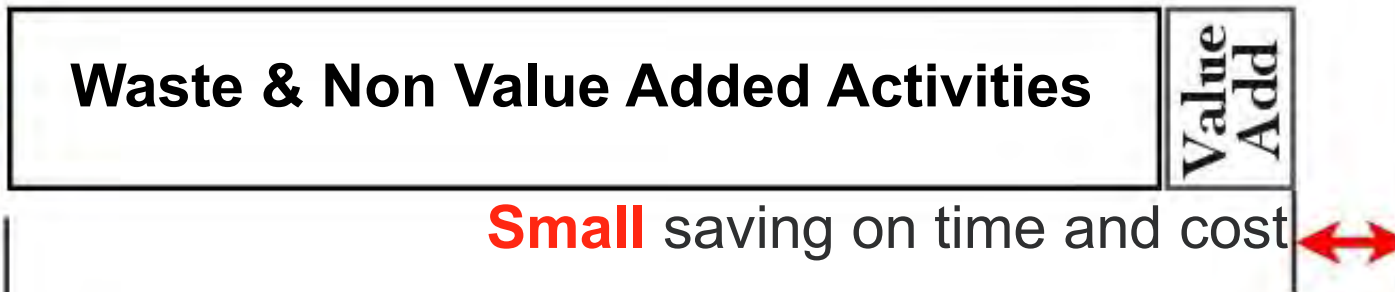
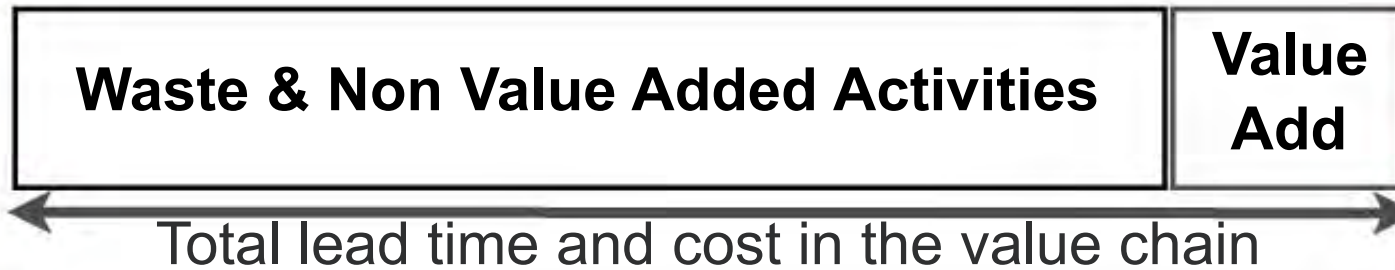


Introduction to VSM

Going Lean

	Senior Managers	Lean Champions	Wider Workforce
What is Lean?	Lean Thinking		
	Understanding Waste		
What is our goal?	Setting the direction		
How we do it?	Understanding the big picture		
		Detailed mapping	
		Getting suppliers & customers involved	
Will it work?	Check the plan fits the direction & ensure buy-in		

Why go Lean?

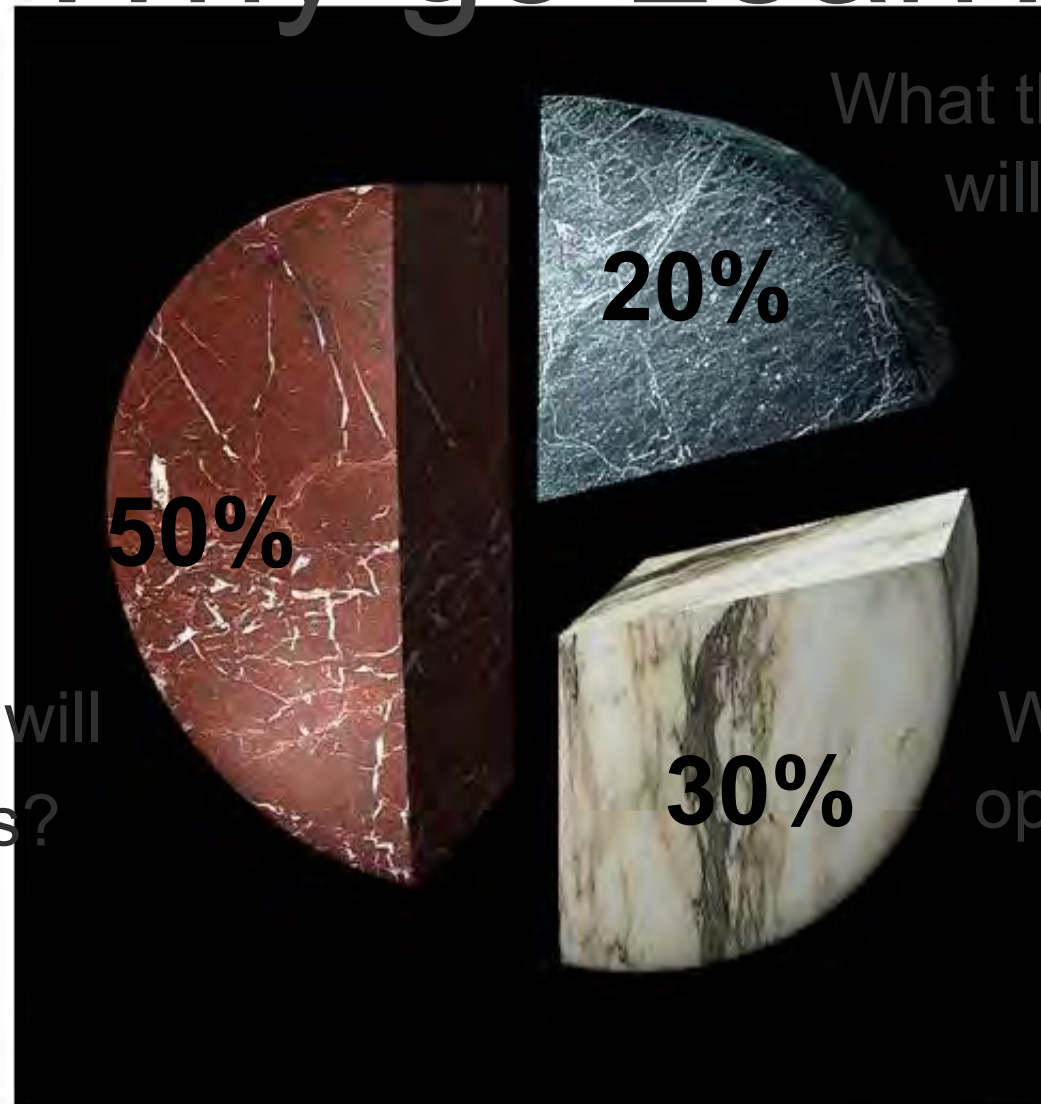


Work Harder



Work Smarter

Why go Lean?



What the customers will pay for?

20%

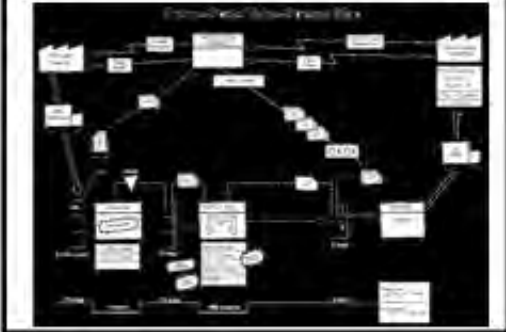
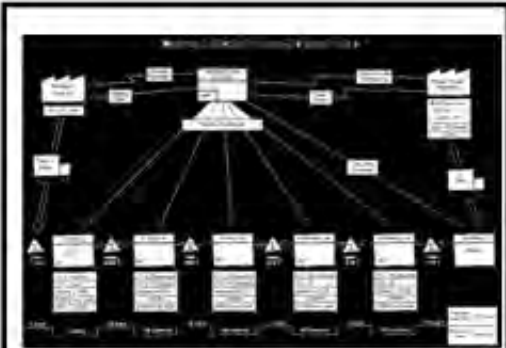
50%

What you will not miss?

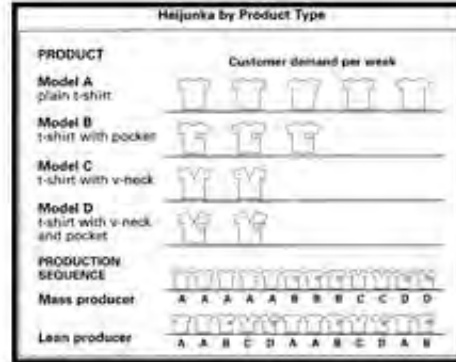
30%

What to keep your operations running?

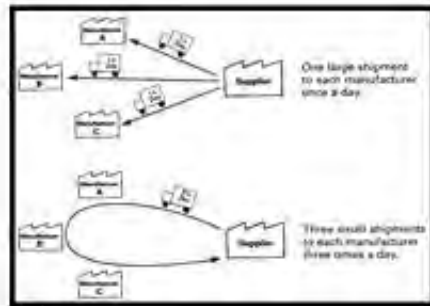
Lean Techniques



Value Stream Mapping



Heijunka



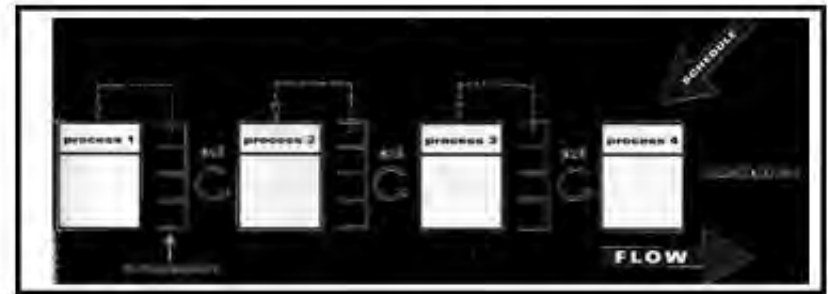
Milk run



Continuous Flow



Load Leveling Box



Kanban/Pull system

7 Waste

Takt time

5 Why

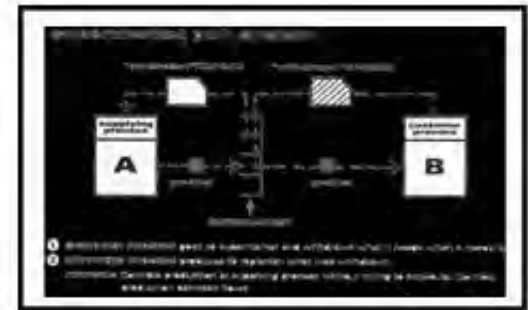
PDCA

JIT

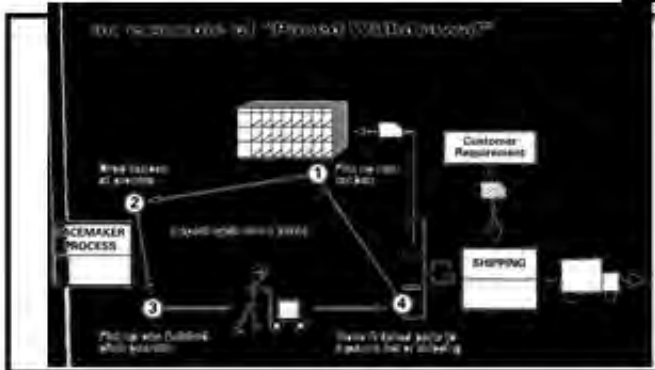
5 S

Pokayoke

DMAIC

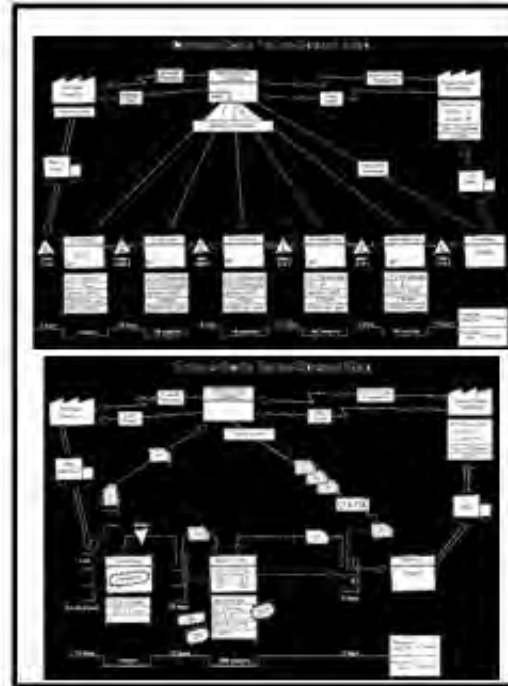


Supermarket pull



Pacemaker withdrawal

Lean Techniques



Value Stream Mapping

“Visualisation tool to understand and streamline work processes.”

Outline

- n· Value Stream Management
- n· Value Stream Mapping
- n· Current State Map

What is Value Stream?

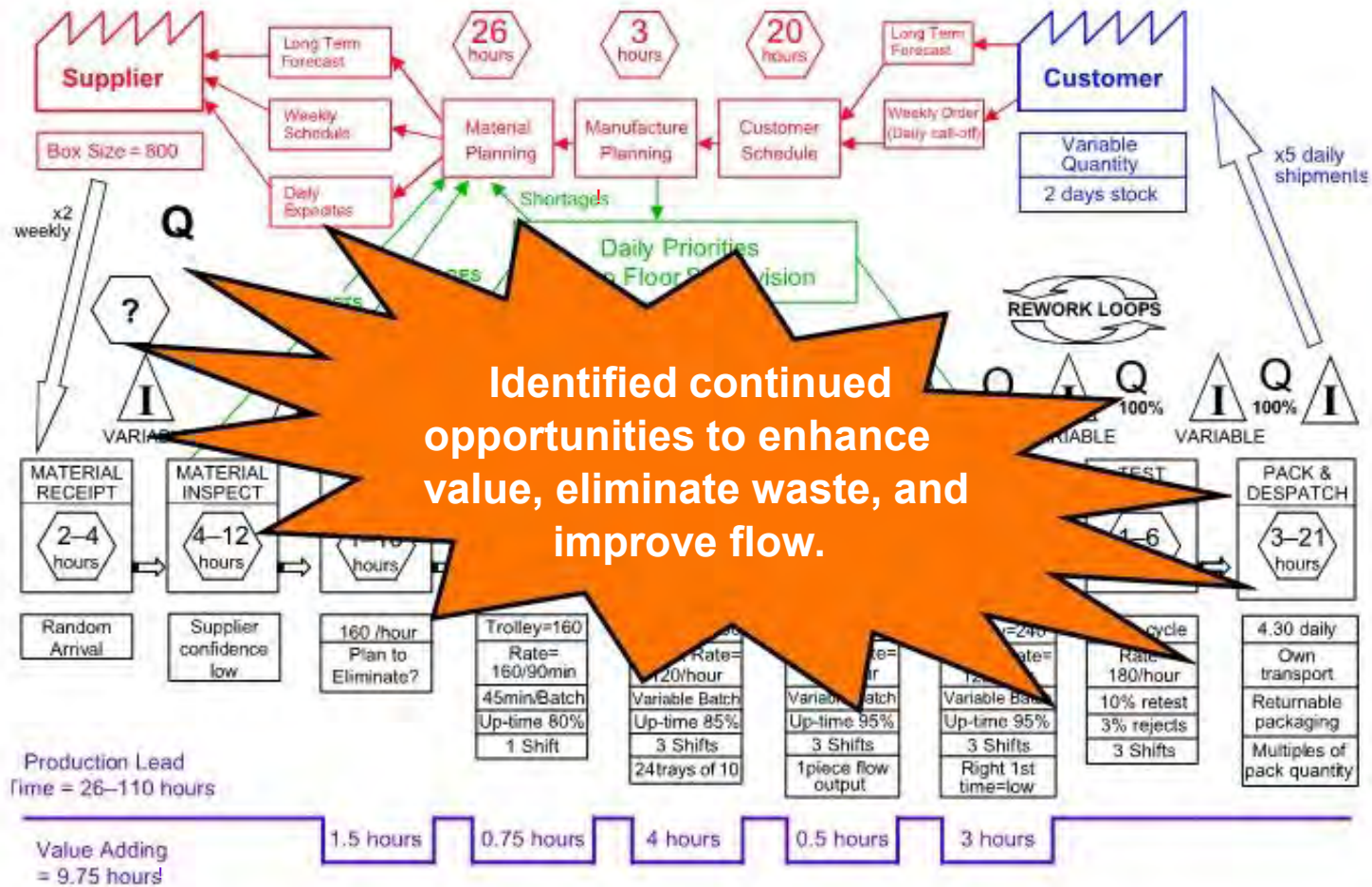
The set of all specific actions required to bring a specific product/service through the three critical management tasks of any business:

1. Problem solving (e.g., Design)
2. Information Management (e.g., Order processing and other non-production activities)
3. Physical transformation (e.g., converting raw materials to finished product)

Value Stream Management

“A process for measuring, understanding, and improving the flow and interactions of all the associated tasks to keep the cost, service, and quality of a company’s products/ services as competitive as possible.”

Value Stream Management



Value Stream Map

Value Stream Management

Act

- n· Observe the new current condition and set new targets.
- n· Make the plan a standard that can be audited and maintained.
- n· Repeat the cycle.

Check

- n· Check outcome against plan.
- n· Reflect on what works and not.
- n· Ask “Why?” until there is a clear understanding of what was effective and what was not.



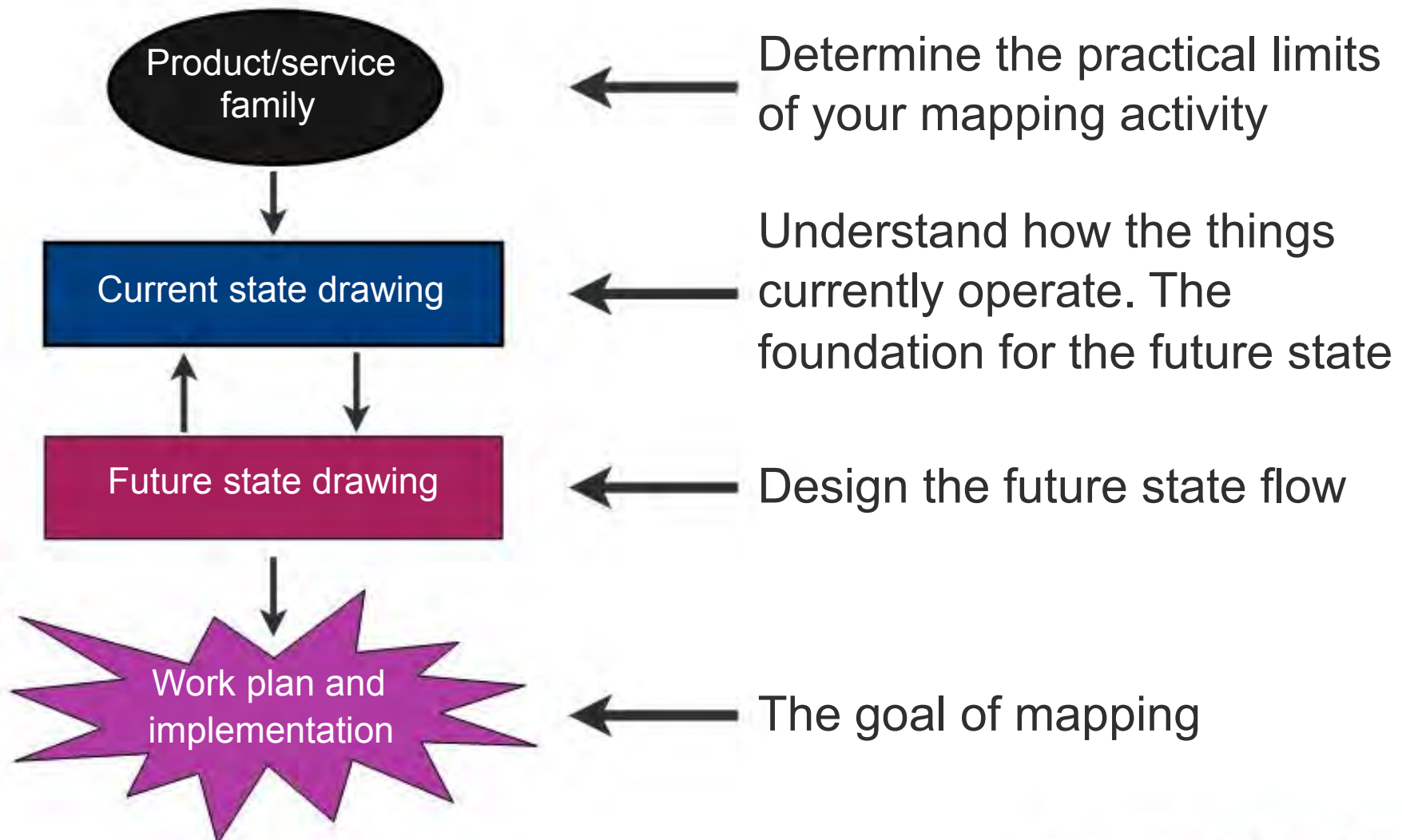
Plan

- n· Identify & construct the VSM.
- n· Document, measure & analyse the complex set of relationships.
- n· Plot a course to create an improved operating strategy and org. design.
- n· Apply appropriate lean tools & techniques to improve the value stream.

Do

- n· Identify the Lean Champions to implement the changes identified.
- n· Communicate the plan to all.
- n· Create lean metrics that drive and support lean behaviour.
- n· Implement the future-state value stream designs.

Approach



Select a Service Family



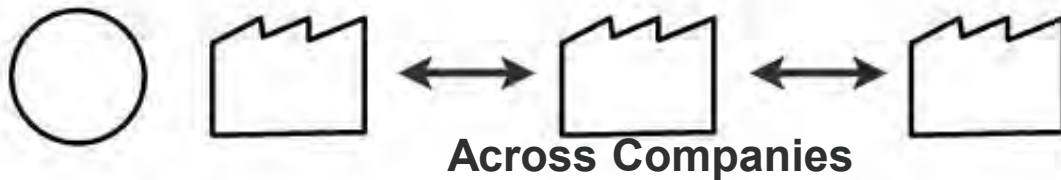
“Isolate the different families to distinguish the needs of the customer and the purposes of the transactions for each of the families.”

Engineering Change Type	Processing Steps			
	Change drawing	Change BOM	Analyze Inventory Impact	Analyze Financial Impact
“A”	X			
“B”	X	X		
“C”	X	X	X	
“D”	X	X	X	X

Determine a Boundary



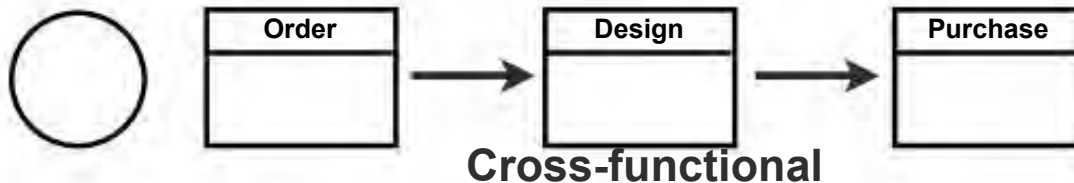
“Decide the appropriate level of detail.”



Visualises how different entities in the **supply chain** coordinate to support a final customer of their product/service.



Visualises how one or more sites within a **single company** coordinate to support a customer outside the organisation.



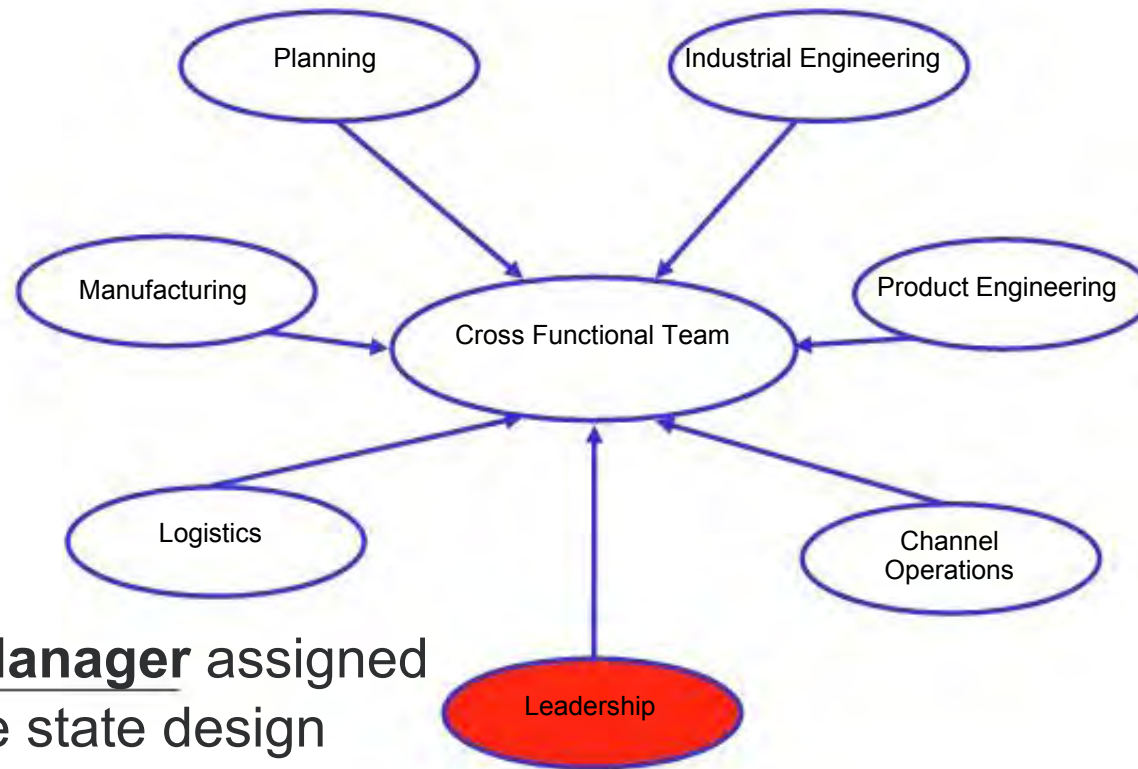
Focus on a value stream redesign within a specific process of a company.



Also known as “Cubicle Level”. Used for a detailed redesign of a specific task within a process.

Value Stream Team

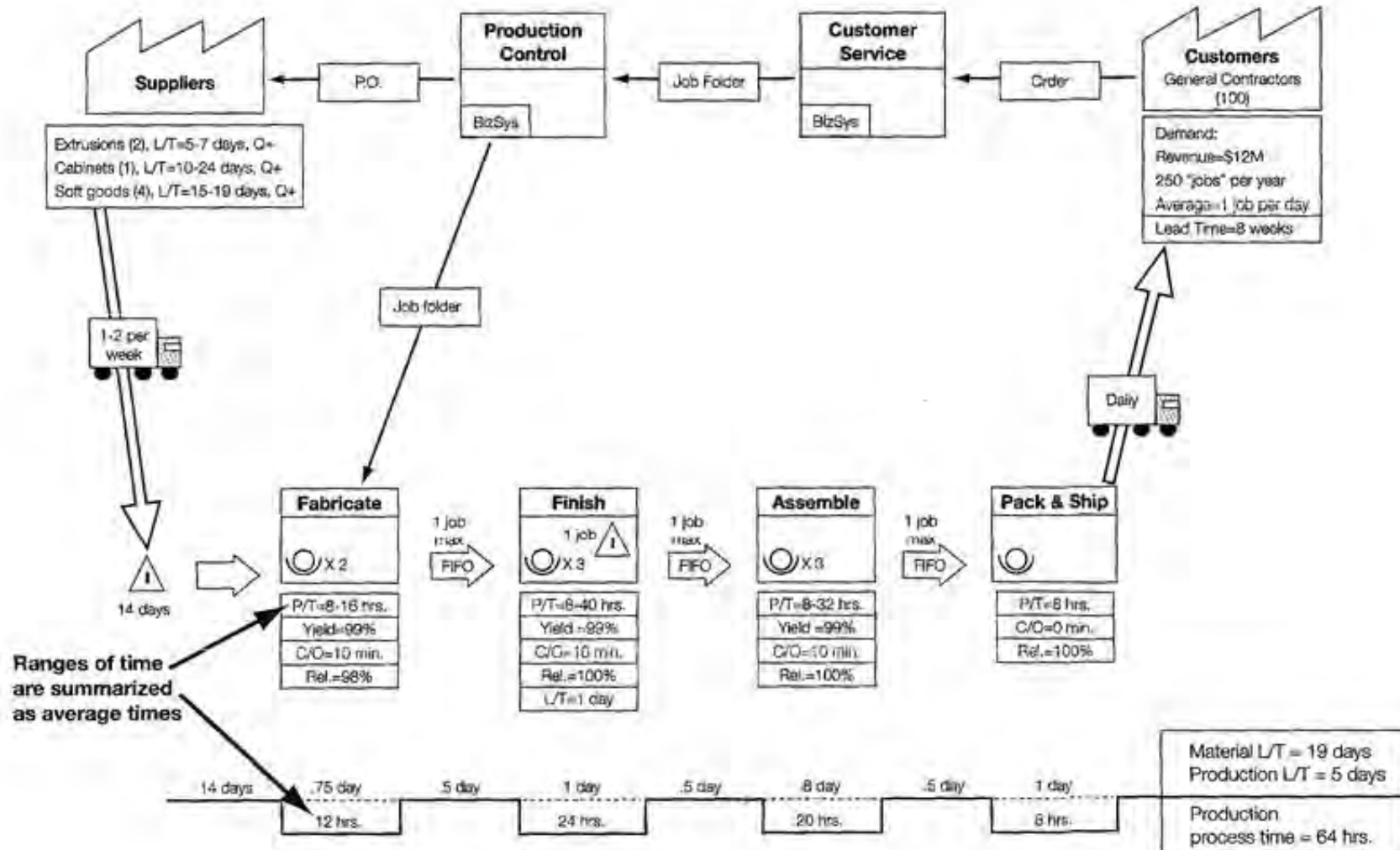
“Cross functional team, educated in lean thinking and value stream mapping.”



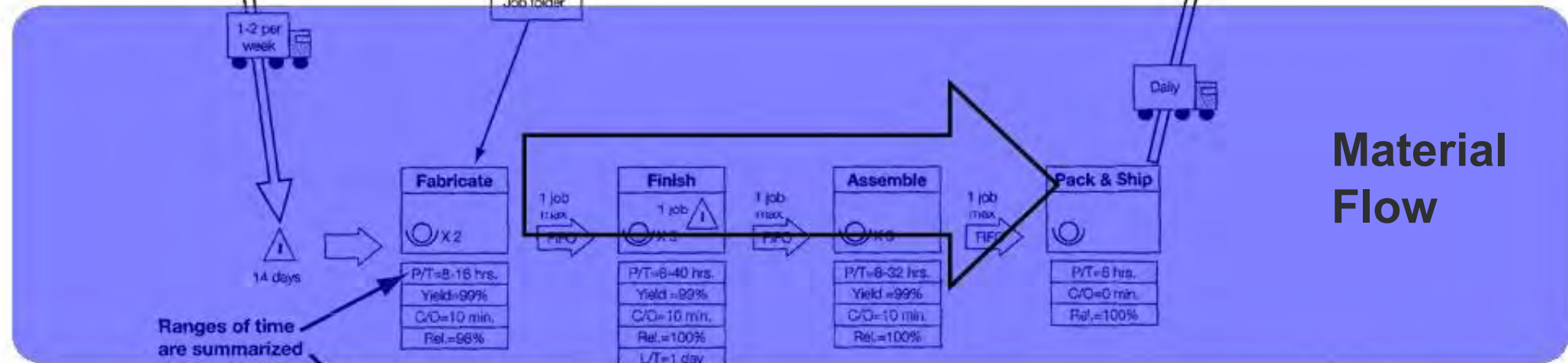
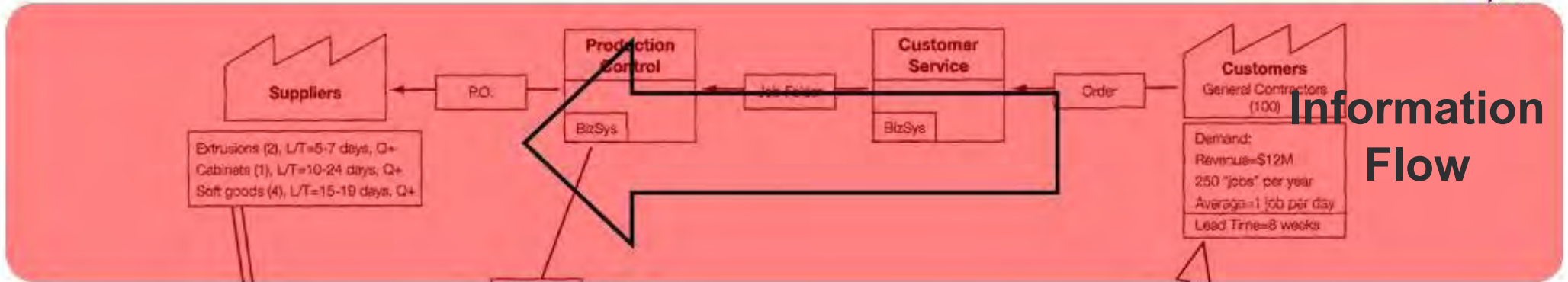
Value Stream Manager assigned to lead the future state design implementation across functional and departmental boundaries.



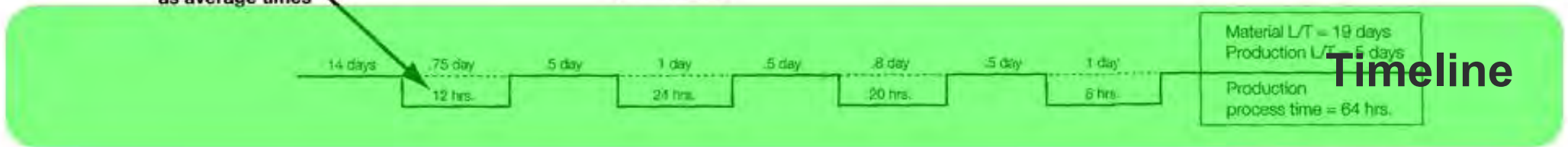
Current State Map



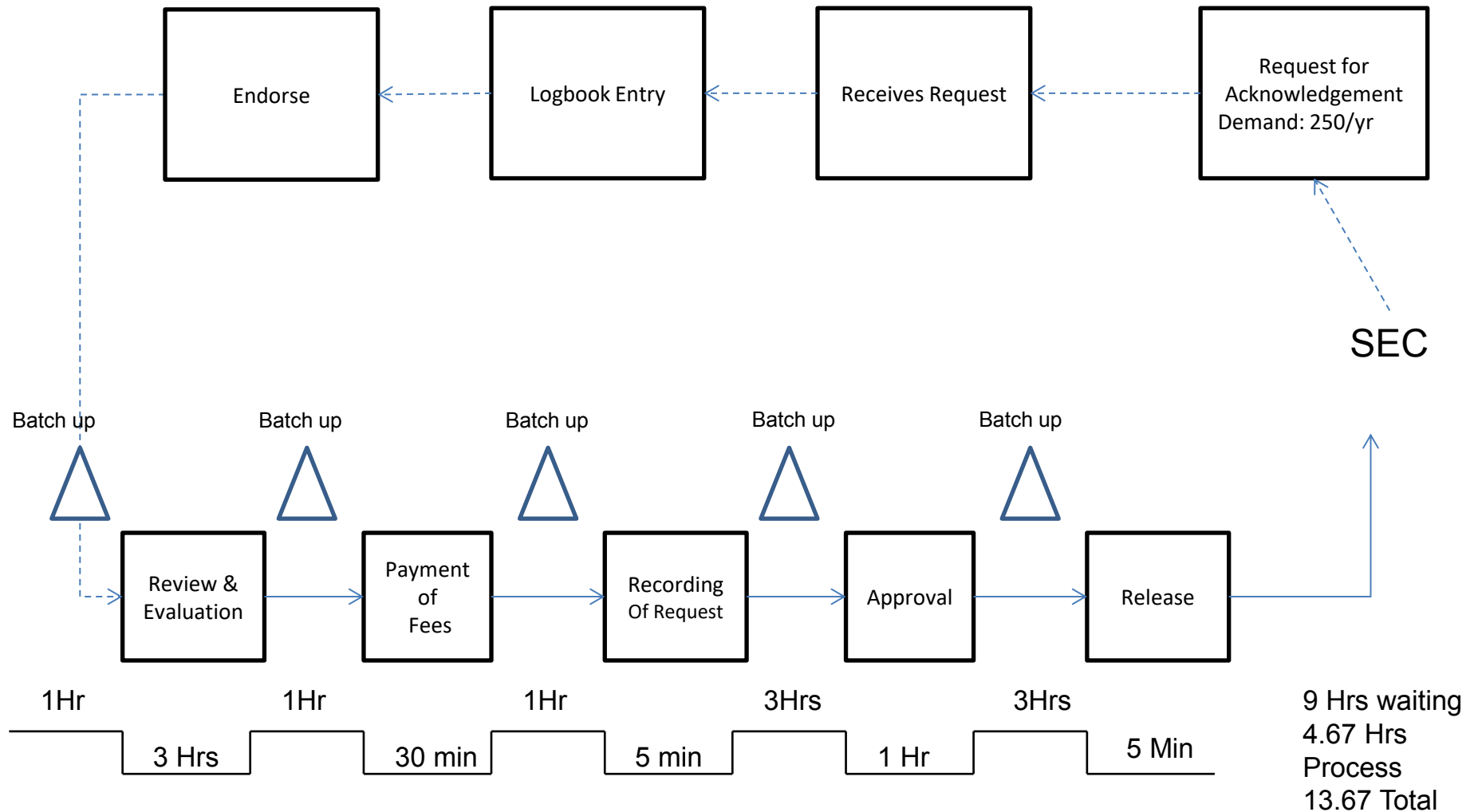
Current State Map



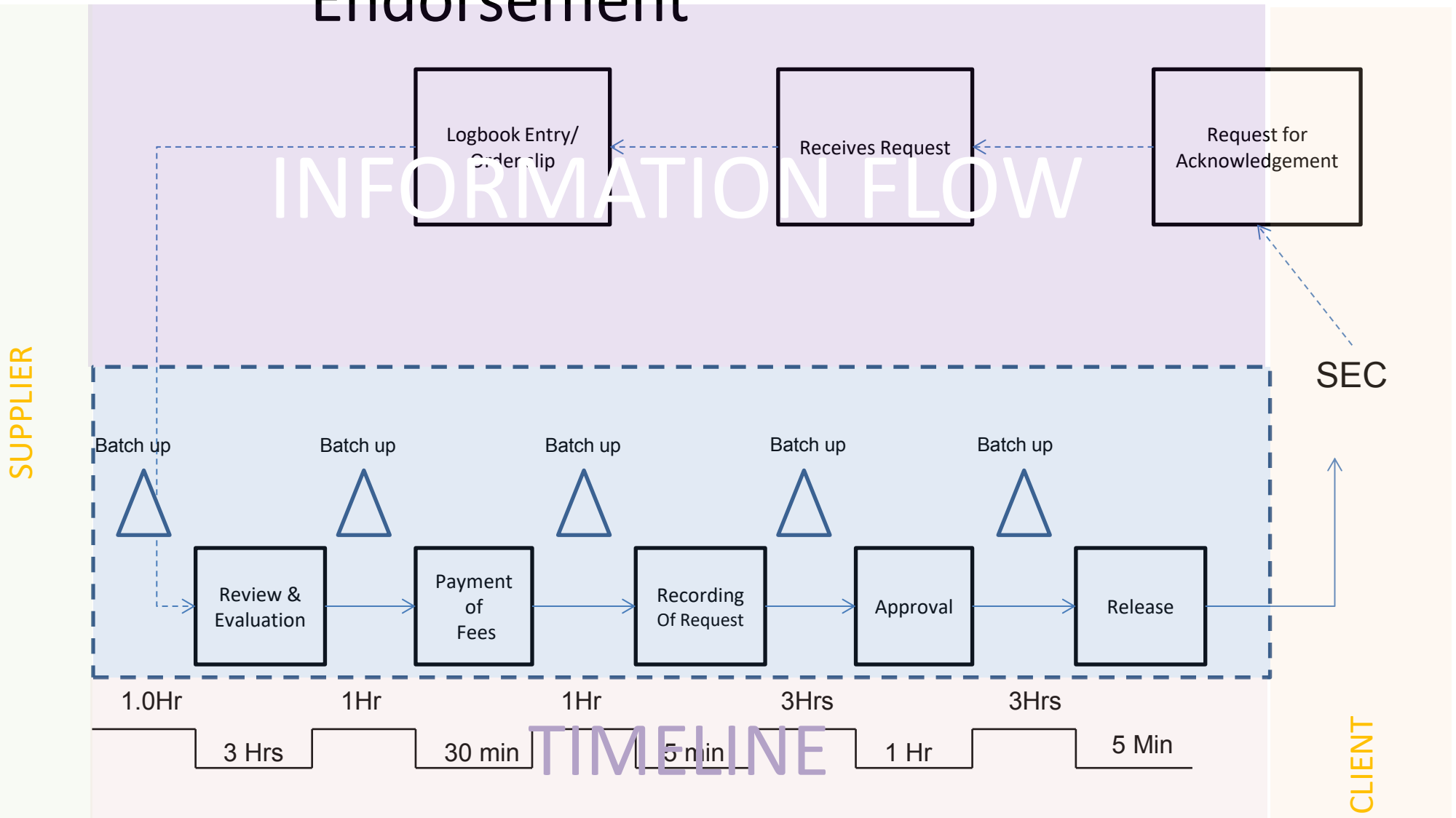
Ranges of time are summarized as average times



VSM: Request for Acknowledgement of SEC Endorsement



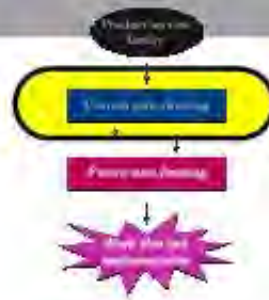
VSM: Request for Acknowledgement of SEC Endorsement


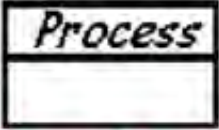
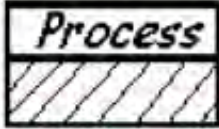


Process	Sub-Processes	Responsible Offices
<p>Acknowledgement of SEC Endorsement</p>	<ul style="list-style-type: none"> • Review and Evaluation • Payment of Applicable fees • Recording of Transmittal of SEC Request • Approval • Release of Acknowledgement Letter to SEC • Records Safekeeping and Archiving 	<ul style="list-style-type: none"> • OIMB Personnel • Treasury Division • Records Section • Office of the Director • Mailing Section • Records Section

VSM Icons

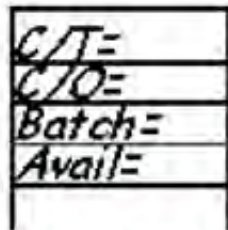
Process Symbols



 <p>Customer/Supplier</p>	<p>This icon represents the Supplier when in the upper left, the usual starting point for material flow. The customer is represented when placed in the upper right, the usual end point for material flow.</p>
 <p>Dedicated Process</p>	<p>This icon is a process, operation, machine or department, through which material flows. Typically, to avoid unwieldy mapping of every single processing step, it represents one department with a continuous, internal fixed flow path.</p> <p>In the case of assembly with several connected workstations, even if some WIP inventory accumulates between machines (or stations), the entire line would show as a single box. If there are separate operations, where one is disconnected from the next, inventory between and batch transfers, then use multiple boxes.</p>
 <p>Shared Process</p>	<p>This is a process operation, department or workcenter that other value stream families share. Estimate the number of operators required for the Value Stream being mapped, not the number of operators required for processing all products.</p>

VSM Icons

Process Symbols



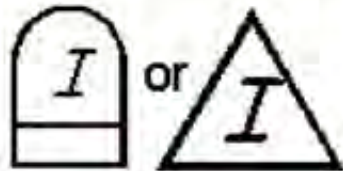
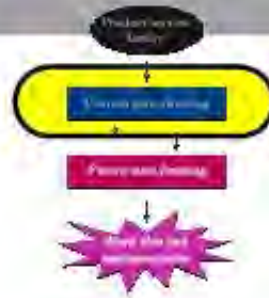
Data Box

This icon goes under other icons that have significant information/data required for analyzing and observing the system. Typical information placed in a Data Box underneath FACTORY icons is the frequency of shipping during any shift, material handling information, transfer batch size, demand quantity per period, etc.

Typical information in a Data Box underneath MANUFACTURING PROCESS icons: C/T (Cycle Time) - time (in seconds) that elapses between one part coming off the process to the next part coming off, C/O (Changeover Time) - time to switch from producing one product on the process to another Uptime - percentage time that the machine is available for processing EPE (a measure of production rate/s) - Acronym stands for "Every Part Every___". Number of operators - use OPERATOR icon inside process boxes Number of product variations Available Capacity Scrap rate Transfer batch size (based on process batch size and material transfer rate)

VSM Icons

Material Symbols



Inventory

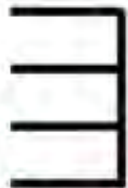
These icons show inventory between two processes. While mapping the current state, the amount of inventory can be approximated by a quick count, and that amount is noted beneath the triangle. If there is more than one inventory accumulation, use an icon for each.

This icon also represents storage for raw materials and finished goods.



Shipments

This icon represents movement of raw materials from suppliers to the Receiving dock/s of the factory. Or, the movement of finished goods from the Shipping dock/s of the factory to the customers



Supermarket

This is an inventory 'supermarket' (kanban stockpoint). Like a supermarket, a small inventory is available and one or more downstream customers come to the supermarket to pick out what they need. The upstream workcenter then replenishes stocks as required.

When continuous flow is impractical, and the upstream process must operate in batch mode, a supermarket reduces overproduction and limits total inventory.

VSM Icons

Material Symbols



Push Arrow

This icon represents the "pushing" of material from one process to the next process. Push means that a process produces something regardless of the immediate needs of the downstream process.



FIFO Lane

First-In-First-Out inventory. Use this icon when processes are connected with a FIFO system that limits input. An accumulating roller conveyor is an example. Record the maximum possible inventory.

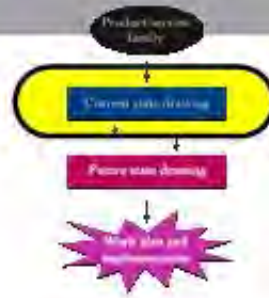


Safety Stock

This icon represents an inventory "hedge" (or safety stock) against problems such as downtime, to protect the system against sudden fluctuations in customer orders or system failures. Notice that the icon is closed on all sides. It is intended as a temporary, not a permanent storage of stock; thus; there should be a clearly-stated management policy on when such inventory should be used.

VSM Icons

Material Symbols



Material Pull

Supermarkets connect to downstream processes with this "Pull" icon that indicates physical removal.



External Shipment

Shipments from suppliers or to customers using external transport.

VSM Icons

Information Symbols



*Production
Control*

Production Control

This box represents a central production scheduling or control department, person or operation.

Daily

Manual Info

A straight, thin arrow shows general flow of information from memos, reports, or conversation. Frequency and other notes may be relevant.

Monthly

Electronic Info

This wiggle arrow represents electronic flow such as electronic data interchange (EDI), the Internet, Intranets, LANs (local area network), WANs (wide area network). You may indicate the frequency of information/data interchange, the type of media used ex. fax, phone, etc. and the type of data exchanged.

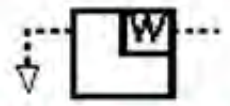
VSM Icons

Information Symbols



Production Kanban

This icon triggers production of a pre-defined number of parts. It signals a supplying process to provide parts to a downstream process.



Withdrawal Kanban

This icon represents a card or device that instructs a material handler to transfer parts from a supermarket to the receiving process. The material handler (or operator) goes to the supermarket and withdraws the necessary items.







Signal Kanban

This icon is used whenever the on-hand inventory levels in the supermarket between two processes drops to a trigger or minimum point. When a Triangle Kanban arrives at a supplying process, it signals a changeover and production of a predetermined batch size of the part noted on the Kanban. It is also referred as "one-per-batch" kanban.

VSM Icons

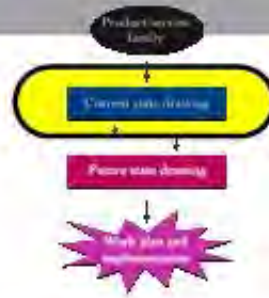
Information Symbols



 <p>Kanban Post</p>	<p>A location where kanban signals reside for pickup. Often used with two-card systems to exchange withdrawal and production kanban.</p>
 <p>Sequenced Pull</p>	<p>This icon represents a pull system that gives instruction to subassembly processes to produce a predetermined type and quantity of product, typically one unit, without using a supermarket.</p>
 <p>Load Leveling</p>	<p>This icon is a tool to batch kanbans in order to level the production volume and mix over a period of time</p>
 <p>MRP/ERP</p>	<p>Scheduling using MRP/ERP or other centralized systems.</p>

VSM Icons

Information Symbols



Go See

Gathering of information through visual means.

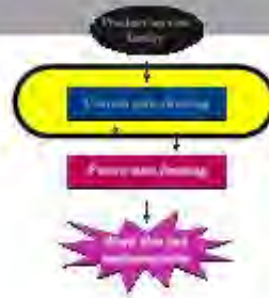


Verbal Information

This icon represents verbal or personal information flow.

VSM Icons

General Symbols



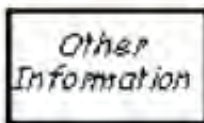
Kaizen Burst

These icons are used to highlight improvement needs and plan kaizen workshops at specific processes that are critical to achieving the Future State Map of the value stream.



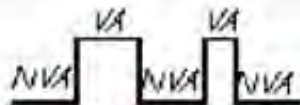
Operator

This icon represents an operator. It shows the number of operators required to process the VSM family at a particular workstation.



Other

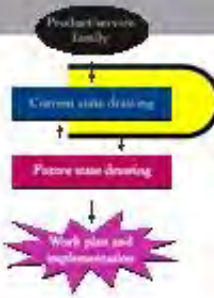
Other useful or potentially useful information.



Timeline

The timeline shows value added times (Cycle Times) and non-value added (wait) times. Use this to calculate Lead Time and Total Cycle Time.

Steps to Complete a Map

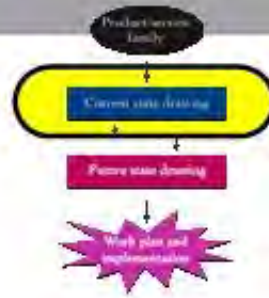
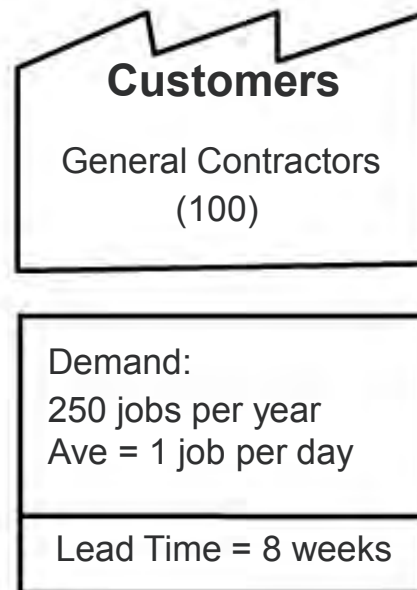


There are 6 steps to creating a site-level current state map. They are,

1. Document customer information and need.
2. Identify main processes (in order)
3. Select process metrics.
4. Perform value stream walk-through and fill in data boxes, including inventory and resident technology.
5. Establish how each process prioritises work.
6. Calculate system summary metrics, such as lead time versus process time, first-pass yield, cost, and/or other value stream summary measures.

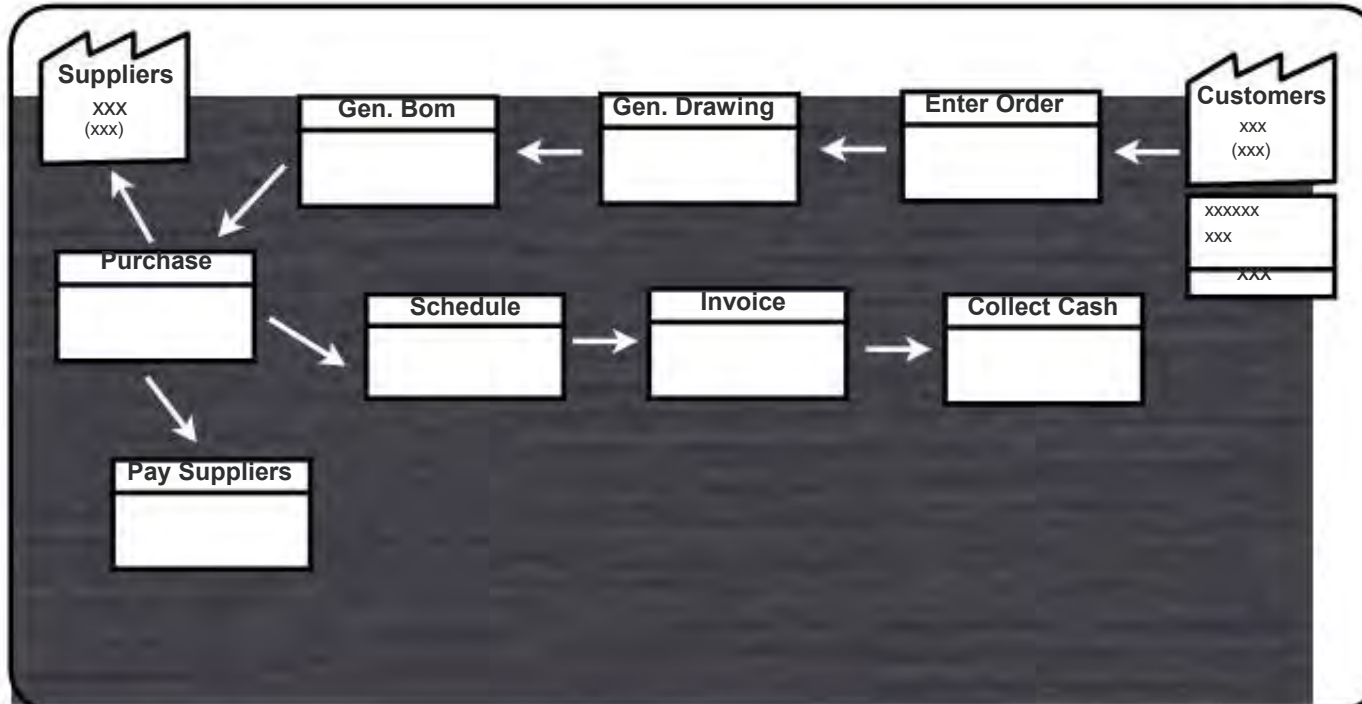
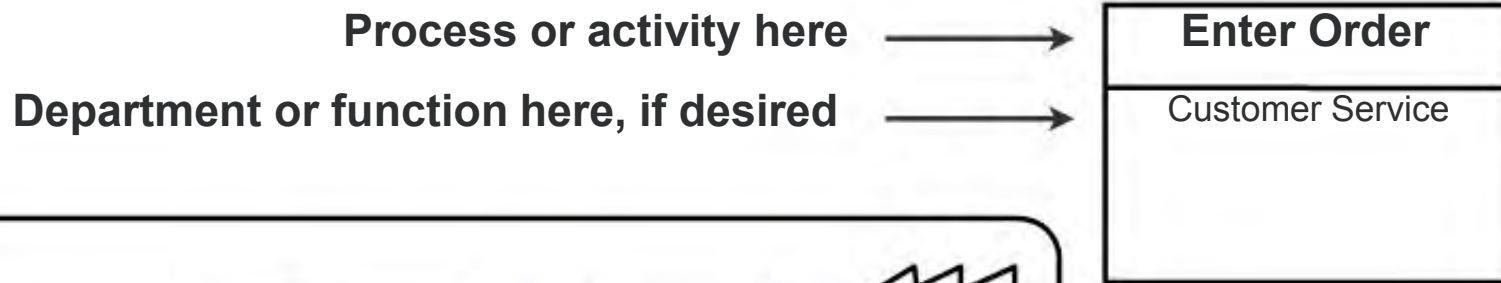
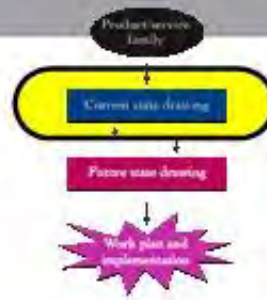
Step 1

“Document Customer Information and Need.”



Step 2

“Identify Main Processes (in order).
Not departments or functions!”

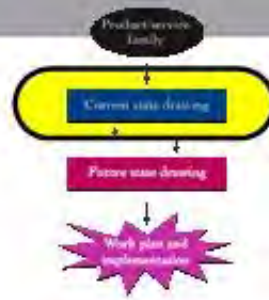


Step 3

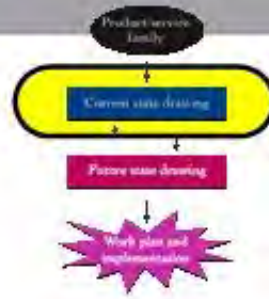
“Select Process Metrics reflecting cost, service, and quality within the value stream.”

Example of Process Metrics,

1. Time: process time, lead time, value-added time etc.
2. Changeover time
3. Typical batch sizes or practices
4. Demand rate
5. Percent complete and accurate
6. Reliability
7. Number of People
8. Inventory
9. Information Technology used
10. Available time



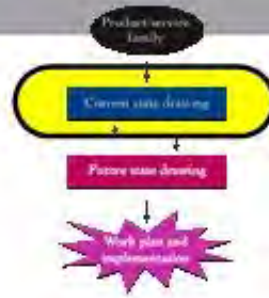
Step 4



“Perform Value Stream Walk-Through. Understand how work is created, progresses, and is organised.”

“Observes each of the main process steps identified in Step 2 and collect the agreed-upon data at each step.”

Step 5



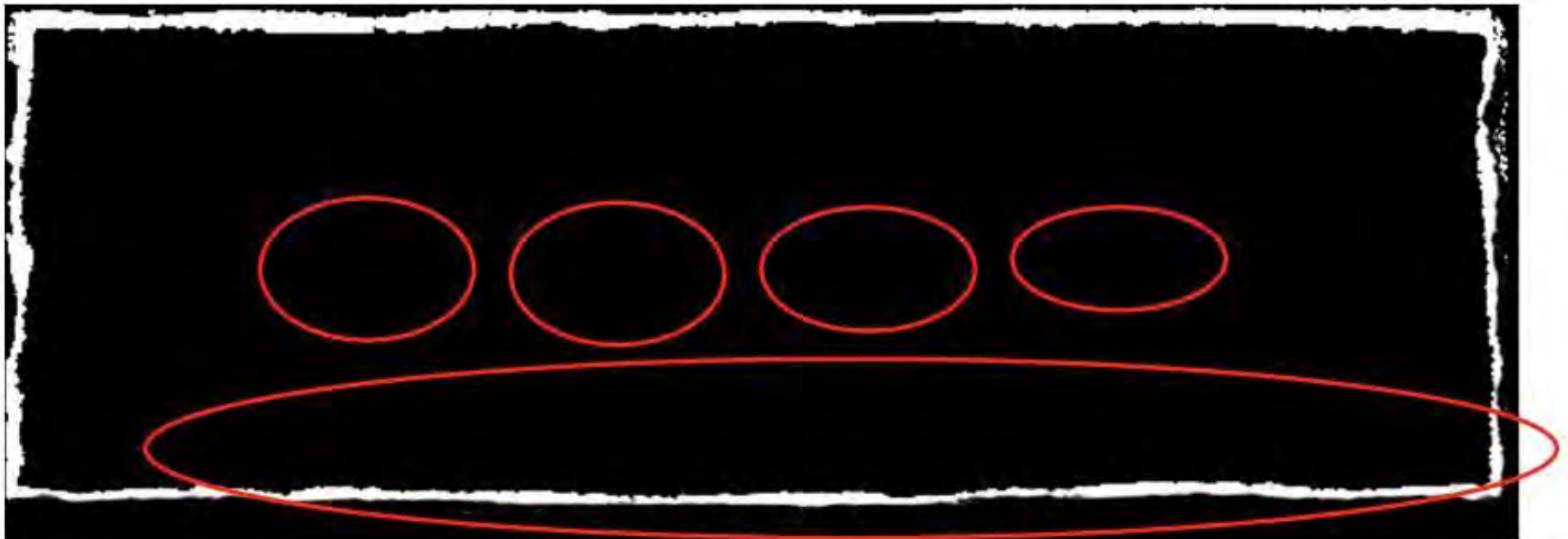
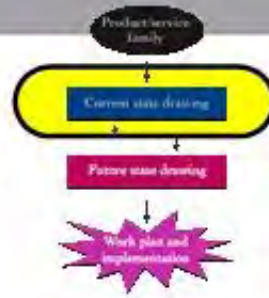
“Establish how each process prioritises work.”

“Instructions, Scheduling logic or Prioritisation.
Example, by due date, by order size, by customer etc.”

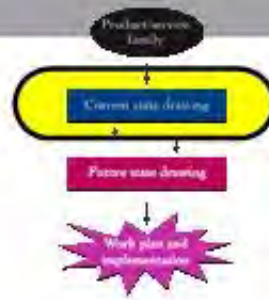


Step 6

“Calculate System Summary Metrics.
Assess the value stream performance from a
systems perspective.”



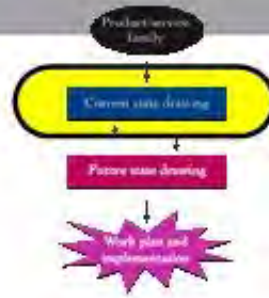
Tips for Mapping



- Identify the basic process boxes before performing the actual walk-through.
- Identify the metrics that the team will collect for each process box.
- Add other information (via visual icons or metrics) as you observe the process in motion.
- Guard against making the map too unwieldy; start simply, and add boxes as necessary.
- Estimate the performance of the current state the first time through to get a quick picture of the value stream as it exists.
- Walk the value stream to gather the performance data associated with creating the value.

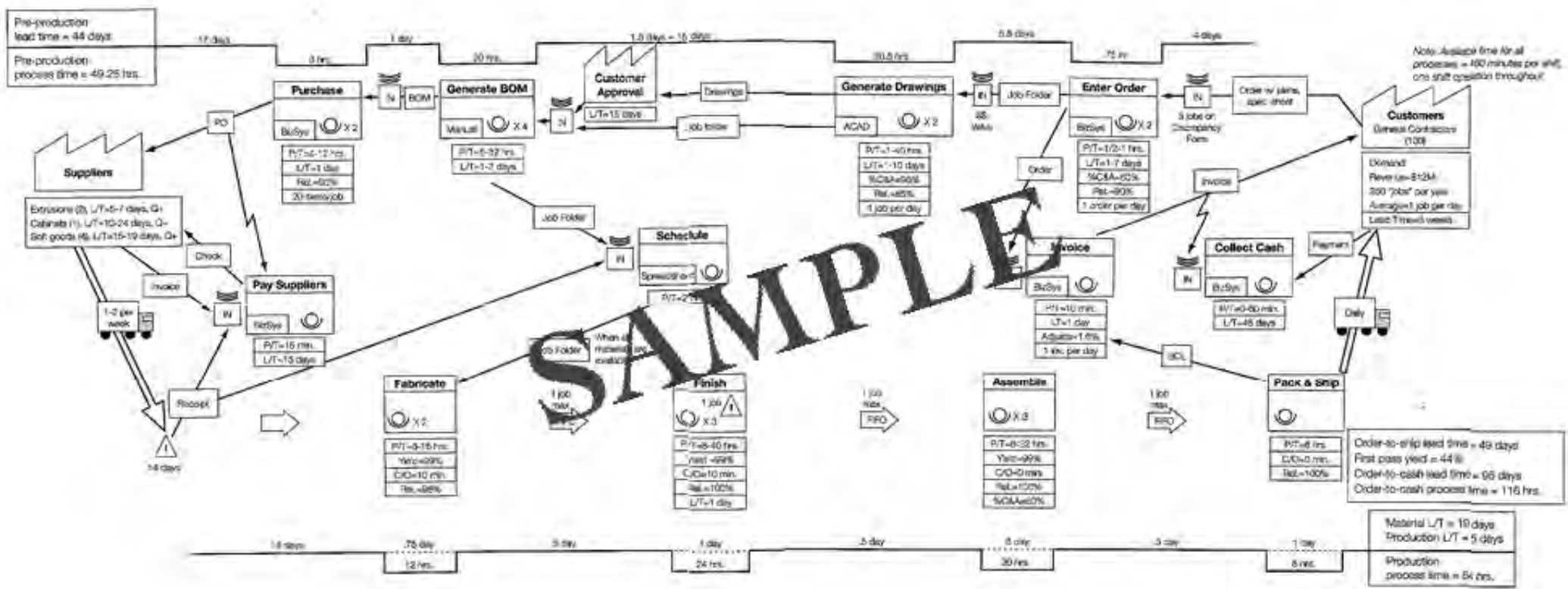
Tips for Mapping

- Ask questions regarding activities and issues you see to understand potential barriers in designing future states.
- Map the whole value stream as a team.
- Assign team members specific tasks to perform in the mapping process.
- Always draw by hand and in pencil.



Current State Map

“Go through the steps and start drawing your Current State Map!”


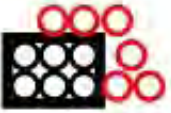








Value Stream Analysis





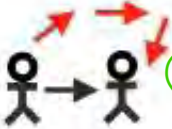



Outline

- n· Understanding Wastes
- n· Fish-Bone Diagram

Lean Manufacturing

- n· Defect  (Rejects)
- n· Overproduction  (Producing more than required or too early)
- n· Waiting  (Queue waiting to be processed)
- n· Non-utilized people  (Idling Personnel)
- n· Transportation  (Unnecessary movement of materials/goods)
- n· Inventory  (Unnecessary Stocks or Work-In-Progress)
- n· Motion  (Unnecessary movement of people)
- n· Extra processing  (Unnecessary processing)

Lean Office

- n· Nonconforming Output  (Mistakes)
- n· Overproduction/supply  (Information Overload)
- n· Waiting  (Waiting for Information/Document)
- n· Non-utilized people  (Idling Personnel)
- n· Transportation  (Relay of information)
- n· Inventory  (Stacks of Files/Documents)
- n· Motion  (Unnecessary movement of people)
- n· Extra processing  (Unnecessary processing)

Waiting

“Waiting for Anything (People, Materials, Machines, or Information) is WASTE.”

“It is the easiest of the seven wastes to detect.”

“It is the most personally aggravating.”

Waiting

“Waiting for machine to process is waste. Unfortunately, most machine don’t know that you are waiting.”

“Does the pot boil faster being watched?”

Waiting

- n· Two general approaches to address the 3 rules



Purchase or rent machines with shorter cycle times.



Create an environment conducive to flexible employees performing other tasks while the machine cycle. *Eg. Cell layout of multiple machines where the operator can attend to other machines while waiting for one to complete.*

- n· Because the waste of waiting is so easily detectable, converting the other six types of waste into it will enable problems to become more visible, and hence, easier to address and solve.

Waiting

- n· Waiting for photocopies, fax, or computers
- n· Waiting for unreturned telephone calls
- n· Waiting for late reports
- n· Waiting at meetings that don't start on time
- n· Waiting while trying to locate a missing file
- n· Waiting for office supplies (when no one bothered to indicate they used the last one!)

Motion

“Unnecessary work movements are a form of waste. All motion or movement ideally should add value to the product or service produced for the customer.”

“Difficult form of waste to detect because business is biased towards action.”

“Whether it is value-add or not, we’re always doing something so we aren’t guilty of being lazy, or unmotivated.”

Motion

“Substance versus Appearance. In short run, a high energy profile may help your job rating; but if customer is paying for the illusion of work, the game will eventually come to an end.”

“Ineffective job processes and layout are often the culprit for creating more motions than necessary.”

Inventory

“Too much of anything is waste; Anything unneeded is waste.”

“Extra inventory is safety stock. It provides you with a comfort level.”

“This is the toughest of the waste habit to break!”

Inventory

- n· Unneeded inventory causes other problems



Shelf Life - *Eg. Pens and markers hidden in deep recesses of office desks tend to dry up.*



More difficult to manage - *The more you have, the more you have to manage.*



It gets in the way - *Extra inventory can obstruct other processes. When looking for a lost item, its just one more thing you have to go through to find it.*

- n· **It hides the effectiveness of your process.** By removing this safety net of extra inventory, you make your problems more visible.

Inventory

Inventory hides problem



Inventory

- n· Office Supplies
- n· Just a few extra xerox copies
- n· Extra files, in which to keep those extra photocopies
- n· Too many meetings
- n· Too many machines - eg. Computers

Inventory

n. Is more really good???



You can never have too many



More is better



Buy two get one free



They are cheaper by the dozen

“When it comes to the temptation of extra inventory, **JUST SAY NO!**”

Transportation

“Transporting farther than necessary, or temporarily locating, restacking, or moving parts (including people, paper, and information).”

“Reduce your amount of inventory, and reduce the distances to as short as possible.”

“Transportation often causes damage.”

Transportation

- n· **Temporary storage.** It is a prim-facie evidence that the muda of transportation is lurking in your processes, as well as the wastes of extra inventory and motion.
- n· **Temporary storage is a place where things get broken, stolen, tripped-over, or lost.** Like motion, transportation has the appearance that work is done. But it add no value to the product or service.

Extra Processing

“Processing things that the customer doesn’t want or even recognize (and is unwilling to pay for) is the waste of processing.”

“Extra packaging to please customer but end up removed by customer because its too bulky.”

Extra Processing

- n· Unpacking parts
- n· Too many signatures on an approval document
- n· Redundant activities - through not knowing other's roles and responsibilities
- n· Handling a piece of paper too many times
- n· Preparing a 30 page executive reports or minutes that aren't read



Nonconforming Output

“Redoing, Correcting, Reworking - All are waste.”

“Do it right the first time!”




“Usually mistakes are caught at the last minute.”

Nonconforming Output

- n· Worst case is when your customers are the first to find the mistake. Then one of the 2 things usually happens,
 -  **They angrily notify you of it.** While it seems like a bad alternative, it provides feedback to correct the mistake not only with them but with other customers
 -  **They don't notify you of it.** They just go away mad.

Nonconforming Output

n. Waste of correction

-  **Requires additional resource.** Extra inventory, time & effort
-  **Redoing process which themselves contain waste.** We treat ourselves to a second helping of waste.
-  **Opportunity cost is at a premium.** Your time and resources should be spent doing something else - adding value, or going home!

Nonconforming Output

- n. Waste of correction is one of the more visible forms of waste. Its known by the company it keeps.



Anger



Panic



Stress



Frustration



Job insecurity



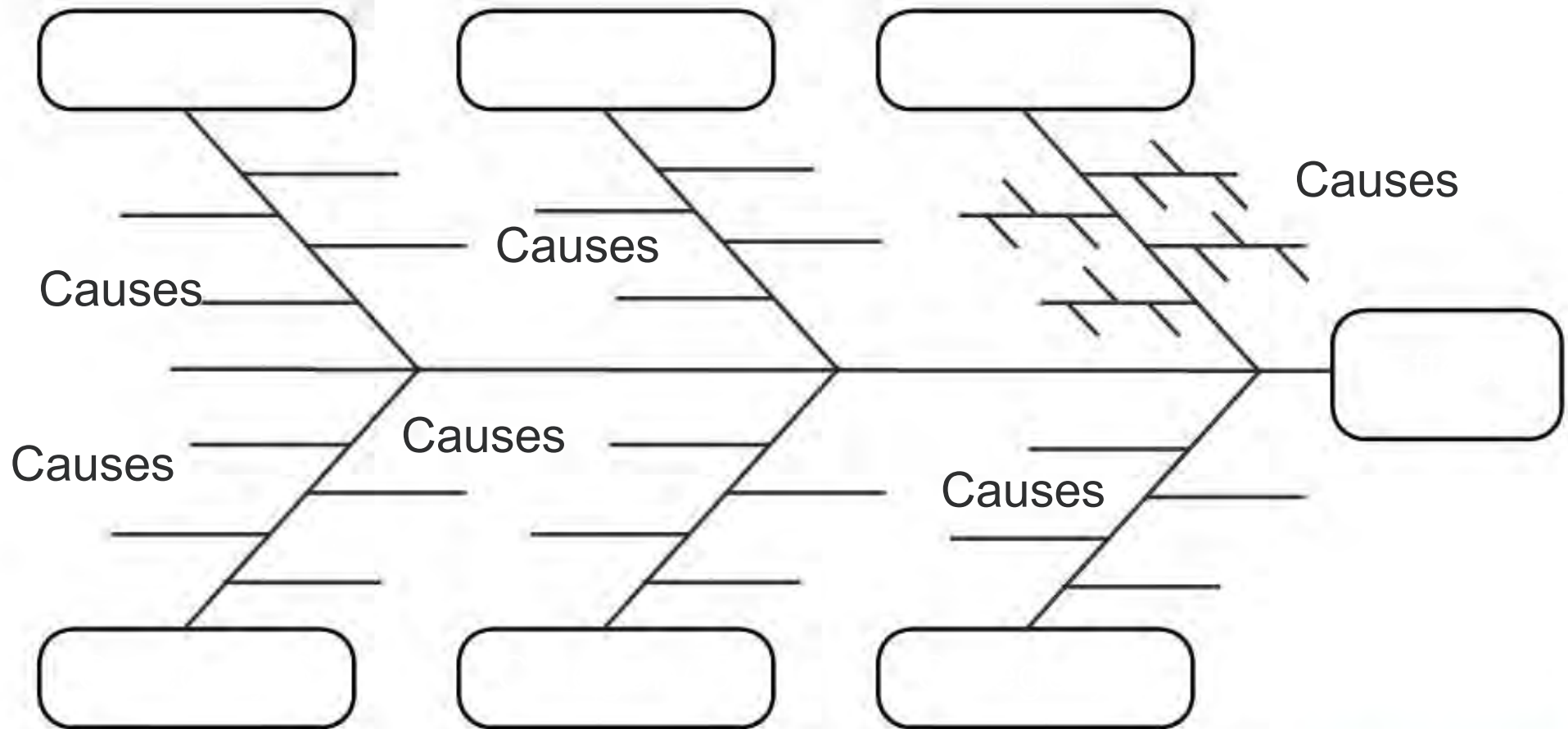
Despair



Blame

Fish-Bone Diagram

a.k.a “Cause & Effect” or Ishikawa Diagram



Fish-Bone Diagram

n· Manufacturing Industry (6M)



Machines



Methods



Materials



Measurements



Mother Nature (Environment)



Manpower (People)

n· Service Industry (4P)



Policies



Procedures



People



Plant / Technology

Fish-Bone Diagram

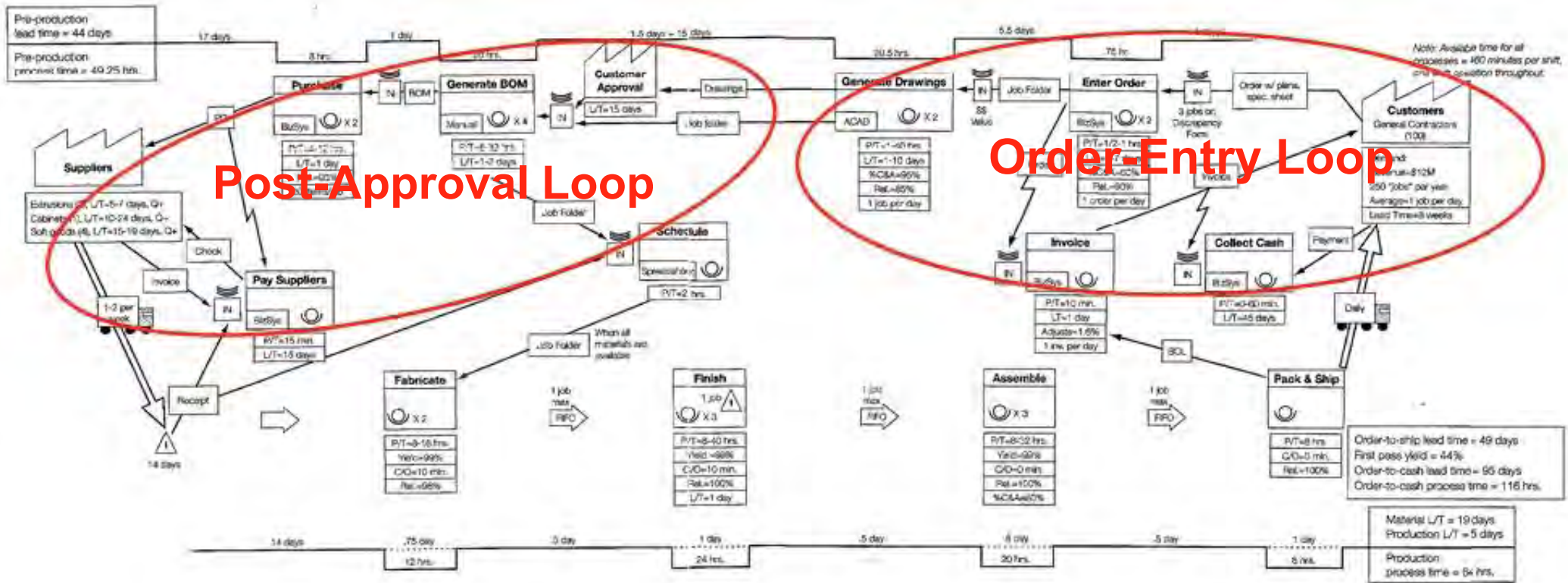
Practice

1. Find, Theme, Vote and Identify key PROBLEMS
2. Find, Theme, Vote and Identify the CAUSE of the 1st Problem
3. Find, Theme, Vote and Identify the Cause of the Cause of the 1st PROBLEM
4. Repeat Step 2
5. Repeat Step 3

Lean Implementation Planning

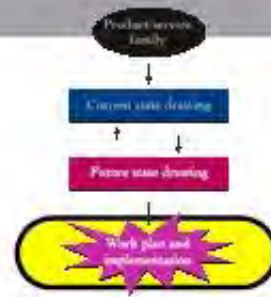
Implementation Plan

“Break the work plan into loops.”



Implementation Plan

“Prioritise Loop Implementation.”



To prioritise kaizens within loops and minimise implementation resources, we use the following common sense approach,

- Eliminate non-value-added tasks that don't require new information technology efforts.
- Simplify the remaining steps that require minimal information technology support (e.g., minimising transaction entering the value stream).
- Implement flow of transactions or paperwork: process one, move one (e.g., improve layout, cross-training, cell implementation).
- Implement the solutions requiring significant information technology support.

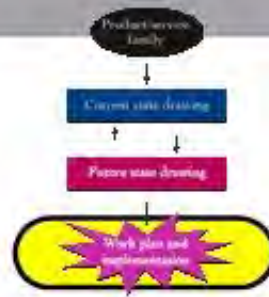
Implementation Plan

“Create a Work Plan and Cross-functional Implementation Teams.”



Process Improvement	Goal(s)	Month												
		1	2	3	4	5	6	7	8	9	10	11	12	
Order-Entry Loop Online order entry (including checklist)	100% C&A L/T = 1 day	→												
Reducing drawing L/T (smaller batches, parallel processing)	L/T = 1-2 days			→										
BizSys & ACAD cross-training	100% cross trained	→	→											
Post-Approval Loop BOM/purchase cell, develop BOM in parallel to customer approval	L/T = 1/2 days				→	→								
Automate bill of materials (BOM) using BizSys capabilities	100% C&A P/T = 8-16 hours L/T = 1 day				→	→	→							
Standardise parts, establish blanket	Supplier L/T = 7-21 days						→	→	→					

Implementation Plan



“Enable Value Stream Management”

Value Stream Management encourages flexibility in meeting market needs through,

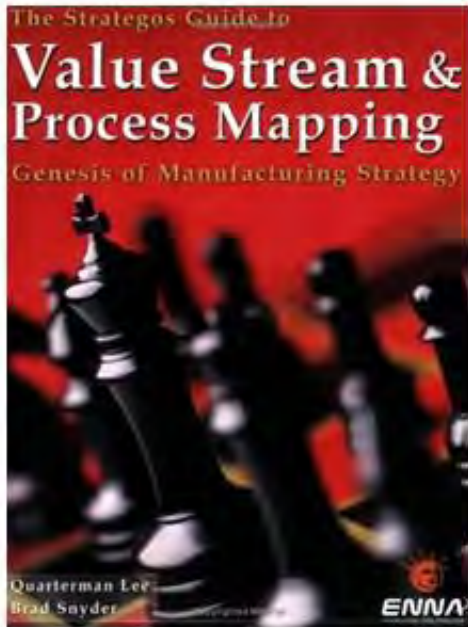
- Growth with improved margins
- Growth with minimal capital
- Growth without additional personnel

“It is management’s responsibility to lead the lean transformation of the enterprise through the support of value stream implementations, and by embracing and demonstrating lean thinking in all areas of the organisation.”

Questions?

Thank You

References



“The Strategos Guide to: Value Stream and Process Mapping” (2006)

by Quarterman Lee, Brad Snyder, and Tracy Epley

“Learning to See: Value Stream Mapping to Add Value and Eliminate MUDA”

by Mike Rother, John Shook, Jim Womack, Dan Jones

